provide a high-speed bi-directional, parallel data transfer link between the two functional blocks. The dsp appears to the microprocessor in the communications block 10 as a local peripheral in its 1/0 map.

An image capture block 12 is based around a CMOS active pixel sensor (APS) imaging chip which is effectively a camera-on-a-chip and the necessary bias circuitry for it. The image capture block 12 acquires images and presents them as a stream of digital data, on an 8-bit wide data BUS to the video buffer block 13. An image from the video buffer block can vary in size, e.g. it can be a full frame or a window (rectangular block) from within the full frame.

Infra-red LEDs can be included in the image capture block 12 to provide infra-red illumination. The DVC can, therefore, monitor either in the visual light spectrum or in the infra-red spectrum and a wide variety of ambient lighting condition.

The video buffer block 13 consists of SRAM for storing image data acquired by the image capture block 12. While another image is being accumulated in the image capture block 12, the main processing block 11 has access to the data stored in the video buffer block 13.

A set of BUS transceivers interface the SRAM in the video buffer block 13 to the 8-bit data BUS system of the image capture block 12 and another set of BUS transceivers interface the SRAM to the 24-bit data BUS system of the main processing block 11. Through the transceivers, dual port access to the SRAM is provided but only one "port" can be accessed at a time. The APS in the image capture block can effectively write 8-bit data into the SRAM of the video buffer block 13.

The dsp can effectively read data from and write data to the SRAM of the video buffer block 13 as 24-bit words.

Image data from the image capture block 12 is passed to the video buffer block 13, 1-BYTE (8-bit) at a time. As each BYTE is passed over it is loaded into one of three BUS transceivers such that every three consecutive BYTES are loaded to effectively form a 3-BYTE (24-bit) word. When 3 BYTES have accumulated in the BUS transceivers they are simultaneously latched to the transceiver outputs and then written into the SRAM as a single 24-bit word.

A sensor/buffer control block 14 consists of a small microprocessor and various discrete logic. Much of the discrete logic is in a programmable logic device (pld). A full-duplex, asynchronous serial link between the dsp and the image capture microprocessor results in the dsp being able to request a variety of options that the microprocessor in the image capture or sensor/buffer control block 14 and the APS are able to provide. The infra-red LEDs are controlled from the microprocessor in the control block 14. The microprocessor in block 14 communicates with the sensor over an I^2C BUS synchronous serial link.

The power supply block 15 takes power from an external source and generates all the necessary power rails for the DVC electronics. Line protection and filter circuitry are included.

In a preferred form of the invention as herein described the following power rails are generated:-

5V for digital circuits in the communications block 10 and image capture block 12;

5V for analogue circuits in the image capture block 12;

5V programming supply for the non-volatile memory in the communications block 10;

3.3V for digital circuits in the main processing, video buffer and sensor-buffer control blocks 11 and 14;

7-10V for the IR LEDs.

Typically, an image captured by the APS is transferred directly into the video buffer 13 via one BUS interface. The dsp then accesses this by another BUS interface and processes it. Compressed images can be stored until they are transferred from the main processing block 11 to the communications block 10 which can transmit them over the Local BUS or overwritten by newer images.

The electronics for the DVC resides on two multi-layer printed circuit board (pcb) assemblies. One is a small assembly consisting of the APS and the bias circuitry and oscillator associated with it, the lens for the APS and IR LEDs used for illumination in dark environments. All other electronics reside on the second larger pcb. The two assemblies are electrically inter-connected using a flexible pcb strip. The pcbs and lens assemblies are housed within a sealed plastic enclosure. A plastic mounting bracket preferably secures the small image capture pcb assembly to the larger pcb assembly in a manner that allows the APS, lens and